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THE OPHTHALMIC RECORD.

G. C. SAVAGE, M. D., Editor and Publisher.

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THE

OPHTHALMIC RECORD.

VOL. II. DECEMBER, 1892. No. 6.

ON THE ASSOCIATION OF SHIPPING DISASTERS WITH COLOR BLIND AND DEFECTIVE SIGHTED SAILORS.*

BY MR. T. H. BICKERTON,

Ophthalmic Surgeon, Liverpool Royal Infirmary.

LIVERPOOL, ENGLAND.

Mr. President and Gentlemen:—

Of the valuable recommendations, twelve in number, made by the Committee on Color Vision appointed by the Royal Society, none gave me greater pleasure to see than the last, which reads thus:—"that in case of judicial inquiries as to collisions or accidents, witnesses giving evidence as to the nature or positions of colored signals or lights should be themselves tested for color-and-form vision." Personally, I should have preferred to see this recommendation head rather than end the series, and for many reasons.

In the first place it could be acted upon at once and without necessitating any addition to the rules regulating the working of the Courts of Inquiry, and in the second place, if acted upon, even now, this recommendation would be the means of furnishing conclusive evidence of the paramount necessity there existed

* Read before the British Medical Association held in Nottingham July 28, 1892.

for the preceding eleven recommendations. I greatly fear that many a score of shipping disasters will occur before the Royal Society's suggestions become part of the law of the land, and when the preceding eleven recommendations have become law defective-sighted and color-blind individuals will be unable to enter the marine service, and thus this twelfth recommendation will be of little value compared with what it would be, were it to come into operation at once.

Throughout the long controversy which has existed between the specialists and those in authority, the one question invariably put by the latter, has been,—point out cases which have been proved to be due to color blindness or defective sight? For a long time this question could not be answered, because sailors on colliding vessels are not required to have their eye-sight tested, but we fortunately can now point to three cases where color-blindness or defective-sight was the sole cause of disaster.

The sinking of the steam-ship "Isaac Bell," involving the loss of ten lives, was due to the color-blindness of the pilot of the steam tug "Lumberman;" the wreck of the "City of Austin," causing a money loss of £40,000, was due to the defective-sight and color-blindness of the pilot (in this case tobacco was at the bottom of the deficiency) and the loss of the "Carbet Castle" was, so the owner told me, due to the color blindness or short-sightedness of the chief officer.

The obstinacy of ship-owners in refusing to admit color-blindness and defective sight as a possible cause of disaster, has been great. According to them the look-out men and officers on colliding vessels always have perfect color-and-form-sight, and the bad sighted and color blind men never come to grief.

Then, is it not a wonder that they do not always man their vessels with the defective-sighted ones?

One great reason for believing that bad sight is a potent cause of disaster is the fact that the Board of Trade, in tabulating the causes of marine disasters, make "causes unknown" account for so large a proportion; thus, in the Wreck Register for the year 1887, of 1,263 disasters, no less than 209 are placed under this heading. May not bad-sight have accounted for some of these? The American Board of Trade mentions that, between

the year 1859 and 1886, there were 2,408 collisions, "accidents which it was impossible to avoid" accounted for 1,562, "error of pilot or captain" for 215, "want of observation or proper interpretation of the rules of the road" for 537, "undetermined causes" for 94.

Therefore, of 2,408 cases, at least 846 might have been due, I do not say they were, but might have been due to color-blindness or defective sight.

With regard to these accidents from unknown causes, we not unfrequently read remarks like the following, and I now quote from the "Times" of Feb. 5th, 1889: "A terrible calamity occurred in the English Channel on Sunday night. During fine clear weather, two vessels which had had each other in sight for at least a couple of miles, came into collision, and sank within fifteen minutes, leaving their crews struggling amid the wreckage in the sea. Of 42 men, 23 went down, and all would inevitably have perished, but for the presence of a tug on the scene. This is the third collision within a few weeks, and seamen had almost begun to look upon them as periodical and ordinary occurences, but the appalling loss of life has moved the seafaring population very deeply, and now there are some very strong comments upon their frequency."

All inquiries respecting the cause of this disaster lead to the same conclusion, that it was due to one of those astounding errors of judgment on the part of one or other of the navigators, which seems to defy all attempt at reasonable excuse. Each blames the other. But read in the light of our knowledge, and we have a simple and natural explanation of a so-called mysterious and unaccountable collision; and so long as color-blind and defective sighted men are tolerated in the mercantile marine, just so long may we expect to read of similar "mysterious and unaccountable" disasters.

Take again the following, appearing in the "Times" of August 20th, 1888—"It is admitted that the vessels knew of one another's proximity for several minutes before the one dashed into the other. The weather was not at fault, the sea was not unusually high, there was no fog at the crises; each saw the other approaching in time to put a mile between them, and yet,

five minutes saw the whole tragedy played out and a hundred and five men and women have actually been sacrificed."

Commenting on this terrible disaster, we read, "But there ought to be some means of abolishing disasters like this of Sable Island from the list altogether." Here was neither recklessness nor calculated audacity, nor lethargy. All due vigilance seems to have been exerted and on both sides. But somebody, whether on board the Geisler or on the Thingvalle must be responsible, though probably no penalty can ever be exacted. But the rule of the road at sea itself needs to be brought to trial, if two well-found ocean steamers in ordinary Atlantic weather, with crews and officers reasonably on the look-out, can, either by its observance or its non-observance, find themselves suddenly locked in a murderous embrace. The rule ought to be so simple and unmistakeable as to render a collision in the circumstances of last Tuesday impossible.

"Controversies, of which our columns have frequently been the scene, prove that sailors, lawyers, and merchants have not, as yet, been perfectly successful in devising one adequately free from ambiguities. The awful end of the Geisler is additional testimony to their failure. The world has a right to demand of maritime experts rules on the subjects of collisions which only blind men or madmen shall be able to misunderstand or disobey."

Yes, gentlemen, the "Times" in this last sentence most unconsciously hit on the real cause of these terrible collisions due to so-called "unknown causes."

Let me read the sentence again, "which only blind men shall be able to misunderstand or disobey." Here, at last we have the truth the whole truth, and nothing but the truth. Sailors, lawyers and merchants have failed, while we, the ophthalmic section of the medical profession, have been crying in the wilderness for the last one hundred years.

Ninety-eight years ago Professor Wilson, of Edinburgh, wrote these prophetic words: "the apalling yearly list of lost vessels which appears in our Wreck Returns awakens the suspicion that more than one of these fatal disasters may have resulted from the mistaken color of a lighthouse beacon or harbour lamp which on a strange coast and with the accompaniment of a snow

storm or a thick fog has been wrongly deciphered by a color-blind pilot."

Since then, the energies of many medical men have been directed to this subject, and have done their best to impress upon the authorities the absolute necessity there exists for allowing only those men to be sailors who have perfect far-sight and perfect color-sight, and yet in this year of grace 1892, we have to acknowledge that our efforts so far have been practically futile. True, we have the recommendations of the Royal Society and those of our own Association to point to, but I sincerely hope no member who takes an interest in this subject will abate one tittle of his endeavours. There are none so difficult to convince as those who will not believe, and the men who have had the framing of the "rules of the road at sea" are the very men who hitherto have turned from all suggestions on the eye-sight question with contempt. True it is that their language, judged from examples to be found in the "Nautical Magazine" is becoming moderate and even polite, but they lack knowledge of this subject and they will require our best attention.

The present rule of the road at sea are the only rules for men who have perfect color and perfect far sight. Let the authorities make, as the "Times" asked "a rule so simple and unmistakeable that it can be understood by blind and color-blind sailors." When this has been accomplished we shall be content, but until then we must continue to press upon the public the following facts: that 4 per cent. of the whole population are color-blind; that about 8 per cent. more have marked impairment of sight from refractive errors; that there is no official test whatever as to a sailor's eyesight; that a man may be the subject of any of the forms of eye disease, may have any degree of blindness, or may be so short sighted as to be unable to see distinctly more than a few inches in front of his nose, and yet be at perfect liberty to be a sailor and to become an officer, and that although there is a compulsory color examination (in many cases a most inefficient one) to be passed before a sailor can become an officer, there is no check to a color blind man being a sailor or to his remaining one to his life's end.

One of the conclusions come to by the Royal Commission on

loss of life at sea, was that, "it was the duty of the ship-owner to select competent officers and crew." What more incompetent men could be shipped than color-blind and short-sighted sailors?

Again, I contend, with all respect to the Commission, that the duty does not lie so much with the ship-owner, but with the Legislature whose first prerogative it is to provide for the safety of its subjects. What is the use of compelling ship-owners to provide costly life saving apparatus while, at the same time, they are allowed to take on board collision-making machines in the shape of more or less blind men.

It is a fact, that in spite of all the provisions made by Parliament in 1876, and the great increase of the staff of the Board of Trade entailing a very large charge on the country, there was not only no diminution in the loss of life at sea on merchants vessels, in the years following on this legislation, and up to the year 1883, but a considerable increase. It is not so difficult to suggest a cause, and very likely the correct explanation is to be found in the fact, that whereas formerly ships jogged along at a moderate speed, say six to ten knots, and ample time was given to those in charge to reflect on the possible consequences of porting and starboarding, of late years speed has greatly increased, and with vessels going at 16 to 20 knots and in command of defective sighted men, a very large increase in the death-roll is only natural.

One would have thought, that in the face of so many unaccountable disasters, a genuine endeavour would be made to discover the real cause, but that is the last thing our authorities aim at.

I am glad to find that there is a gallant and distinguished Admiral also of our way of thinking. This gentleman writing to the "Times" in the course of a long controversy, following a very fatal shipping disaster said, "I am alone in my glory here, for no one of those who have given advice to seamen has ever made the least attempt of a serious character to ascertain what are the real causes of collision. They all guess at them and then propose a remedy for the evil they have guessed into being."

This statement coming from one whose opinion is very highly

thought of in high places, is of great interest to us. He evidently thinks he knows of one special cause of accident which has been overlooked. We think we know of another. If the gallant Admiral were to unite his forces with ours, might we not reasonably expect, that such a heading in the Wreck Returns, as "Causes Unknown" would be a thing of the past? At any rate I throw the suggestion out for what it is worth.

The "Times" has stated, and I think truly, that "the primary cause of casualities at sea, like those on road by shore, is either the reckless selfishness of persons in command, or the absence of a proper look-out" (Feb. 9th 1889). The first of these said causes, I am not prepared to discuss, but that the second accounts for a very large number of disasters, no one who reads carefully the Board of Trade Enquiries can deny, and I do not think I am presumptuous in believing that so long as the possibility exists of color-blind and defective farsighted men being chosen to act on look-out duty, no diminution in the number of shipping disasters can be expected.

I wonder how many passengers would go to sea, knowing that the look-out man was color-blind and the captain short-sighted, and yet there are gentlemen, leaders in their profession, who pooh-pooh our contention. One of them is Admiral Colomb, and he has, in my opinion done much harm, and has been a great power in preventing this subject of the color-blindness of sailors receiving the attention it deserves. I believe that the means recommended by the Select Committee for the prevention of loss of life at sea are and must remain futile so long as the very essential of safety, namely, perfect eyesight on the part of officers and men, is ignored. Admiral Colomb thinks differently, but, as I believe, wrongly, and I would have no hesitation in taking a popular vote on the point between us.

In the course of an able paper delivered by him on the subject of the Washington Maritime Conference, at the Society of Arts, and reported in the "Times" of March 28th, 1890, he made the following remarks:—

"As to the qualifications of Officers and seamen, the Conference (Washington) dealt wholly with the question of color-blindness on account of its danger with reference to the red and green

side lights. He never knew himself a case of collision where color-blindness was in question. The statements were generally perfectly clear that wrong helm was given deliberately in the face of the color seen, and as no authoritative teaching had existed to show that it mattered what color was seen so long as danger was denoted, he had never been able to lay stress on the color blind question" Mr. Baden Powell, R. N. R., who followed in debate declared "that, in all cases of collision at sea, there was no default of the rule of the road at sea, but they generally arose from negligence. The rule of the road at sea was perfectly understood by intelligent men, and it was the 'lubbers' and the careless who did not act according to it." While Admiral de Horsey considered "collisions at sea were caused principally by three faults—a bad look-out, ignorance of the rules, and neglect of the rules."

In his reply, Admiral Colomb expressed his opinion that "collisions at night occurred through the helm being ported to the green light, and starboarded to the red, and he could not agree that the collisions occurred wholly through negligence, for he thought that they largely occurred because our seamen were not taught what they should do, and collisions occurred through ignorance."

Now we know that there are a number of well authenticated cases were disaster due to color-blindness and to defective sight actually occurred, or was narrowly averted, and it is surprising Admiral Colomb does not know of them. I would also ask whether Admiral Colomb knows of a single case out of the thousands that have occurred where, after collision, the color sight of the officers and men were tested by an expert.

Would it not be well if Admiral Colomb were to eliminate this cause before denouncing it? One might have thought that, as in most shipping enquiries, the evidence as to the color of the lights, and as to the distance at which they were first seen is bewildering in its contrariness, the first step towards a solution would be to examine on the spot the far sight and color sight of the witness; but those who adjudicate at these enquiries think differently, and take it for granted that the witnesses coming before them have perfect far sight and perfect color sight.

I believe that if the eye-sight of sailors on colliding vessels were tested in court the cause in many cases would be found neither in ignorance nor in negligence, nor in "lubbers", but in the color blindness and defective sight of the officers and men on watch. And in opposition to the opinions of the above eminent Naval Authorities and in strong confirmation of my belief, I will quote the opinion of an officer, who, at the time of the loss of H. M. S. "Vanguard" (which loss I have in a previous number of the *British Medical Journal* reported and traced to the defective sight of a look-out man) was on board H. M. S. "Warrior."

This gentleman writing to the "Liverpool Daily Post" Feb. 23rd, 1889, expressed himself in the following terms:—

"Is it reasonable to believe that steady married seamen with families depending on them, and who have had years of experience, suddenly lose all judgment and common sense, and steer their vessels on clear nights, sometimes in broad daylight, so as to deliberately ram each other, thereby losing their lives and ships, and the lives of the passengers? Surely not? In none of the other professions or callings can we find anything approaching a parallel case; therefore, in some cases their eyesight must be defective."

If Admiral Colomb would only take the trouble to examine personally a color-blind officer, I feel sure that this subject would have in him a distinguished convert, and an able and powerful advocate.

That our judges and those who adjudicate in shipping cases do think, though erroneously, that the sailors and officers doing look-out duty are specially picked men, receives negative proof by the fact that they never have ordered an examination even in a case where there has been direct contradiction as to the color of, and distance at which, a light was seen, and receives positive confirmation by a judgment delivered by Sir, now Lord, James Hannen in 1888. Lord Hannen said "a good look-out was not kept on board the 'Essiquibo,' but it is to guard against the defects, not merely of men's sights, but of their minds and attention that the rule was framed." I venture to think Lord Hannen gave credit where it was not due. The framers of the rule

scarcely believing in the existence of color-blind sailors, and not at all in short-sighted and blind sailors, cannot have appreciated the dangers of employing either, nor, I venture to think, would their successors be in any more enlightened condition, were it not that Dr. Farquharson's action in the House of Commons has been the means of directing public attention strongly to them.

For the first time in the history of Board of Trade Enquiries the representatives of the Board of Trade did take, in February last, official notice of a condition of affairs, to which I have frequently called attention, and which amounts to little less than a public scandal.

In concluding their report, upon the stranding of the Steamship "Violet," they said:—"there is one circumstance which the Court wishes particularly to call attention to. After the close of the inquiry, and the respective certificates had been given up in the usual way, it was subsequently found that the mates certificate bore the memorandum in red ink, 'This officer has failed to pass the examination in colors. (Signed) J. Clark Hall, Registrar-General.' On the face of it, and without some explanation, it seems a most undesirable and reprehensible thing that a Master's certificate should be granted to a man who is apparently unable properly to distinguish colors. The danger of entrusting the command of a vessel to such a man is too obvious to need further comment. And, assuming that a correct register of certificates granted be kept, then the Board of Trade's solicitor conducting the inquiry should have been instructed on the point, in order that he might bring to the notice of the Court the fact, as under certain circumstances, it might have had an important bearing upon the subject of the investigation. (Signed) Wm. M. Angus, James E. Woods, (Justices) A. Anderson, E. Brooks, (Assessors)." Such condemnation of the Board of Trade is well warranted and well deserved, and I hope all interested in the subject, will make every use of this quotation, for it deals a death-blow to the existing regulations, and to the masterly inactivity of the Board of Trade on this subject.

Though the time has not yet arrived when we may relax our vigilance there is occasion for much congratulation. The recent

popular movement towards reform was due to a member of our profession, Dr. Farquharson, M. P. The Royal Society Committee on Color Vision due more or less directly to Mr. Brudenell Carter, and before whom our President, Mr. Priestley Smith, gave valuable evidence, has published a series of conclusions, bearing out in every particular those contentions which we have urged for years passed, while the indefatigable and praiseworthy exertions of Dr. George Mackay of Edinburgh, the honorary secretary to the Committee on the "Efficient Control of Railway Servant's Eye-sight" has added a whole chapter of facts to our knowledge of that subject, and has indicated the necessary reforms.

But the official mind is only just awakening to a sense of its duty, rules and regulations have yet to be made, and it behoves us to watch carefully that these rules and regulations are carried out in accordance with our views. Only when this has been done may we rest, but we shall then be able to point with intense gratification to a bright page in the history of the Medical Profession. The long roll of victims, due to a preventable cause will be diminished; there will be increased confidence in those who go down to the sea in ships, and we shall have earned the lasting gratitude of the entire population of the world.

88 Rodney Street.

THE REGION OF THE MACULA LUTEA IN OPHTHALMOSCOPY.

Written for the Ophthalmic Record by

M. F. WEYMANN, M.D.,

St. Joseph, Mo.,

(Prof. Physiology and Ophthalmology, Ensworth Medical College.)

"As an additional matter we mention the fact that it (the macula) is visible only in a certain number of cases in the form of a little speck marked off from the rest of the fundus by its dark color (Meyer, German edition 1886, p. 17)."

"The origin of the macula is skirted by large retinal vessels which give off numerous twigs toward its center, though none of them can be seen quite to reach that point. In many cases nothing but these indefinite characters mark the yellow spot, but in some, especially in dark eyes and in young patients, a minute bright spot occupies its center and is encircled by an ill-bounded, dark area, round which a peculiar shifting, white halo is seen. This minute spot is the fovea centralis (Nettleship 1890, p. 74)."

"There is a spot of darker color and more granular than the surrounding fundus, uncrossed by any visible retinal vessels but toward which the finer branches of larger twigs radiate, fringing its boundry. This region is the macula lutea. Its center is occupied by a small bright spot (fovea centralis) (De Schweinitz, 1892)."

"The appearance of the region of the macula is most variable. In young persons it is characterized by the presence of a ring with iridescent reflexes, the image of the macula. The color of the fundus is darker and in the center of the circle greyish-brown. Sometimes a whitish point, sometimes a small red spot is seen like a hemorrhagic speck with a central white point. (Chauvel, Examen de l'oveil, p. 353)."

"The center of the macula lutea is prominent by reason of its red color, whose center often appears as a whitish, round, or sometimes hook shaped, spot.

"Frequently the position of the macula is indicated only by the tapering vessels running to a common center, while other signs are wanting. (Schweigger Hand-book Ophth., p. 414)."

"A small spot or a figure corresponding to two sides of an acute angle, with a central light spot. The central white spot comes from the fovea centralis acting like a concave mirror. (Schmidt-Rimpler, 1889, p. 119)."

De Wecker in his great Traite' d' ophthalmologie, comprising four volumes, does not *allude* to the subject at all.

From the preceding extracts it is plain that the description of the macula lutea is a sadly neglected subject among ophthalmologists. It seems hardly possible that such a condition of things could have continued through several decades characterized by

the most untiring efforts in the exploration of the fundus. However, when we consider that one text-book after another repeats to the student the discouraging fallacy that the region of central vision is most difficult to see and that, even after a proper location of the spot, the observations are usually unsatisfactory, we must not be surprised at the systematic neglect of its study. Another cause for this indifference lies in the fact that the macular region is seldom of importance in a diagnostic respect.

For several years I have given special attention to this subject and my findings have caused me to examine every patient under my care for the last twelve months. Besides, I have made numerous observations in some of the public institutions of this city. As a first condition for success in this work I must state that mydriasis is absolutely necessary, which is best obtained by homatropine. The light should be on the side of the eye examined and a shade (square piece of tin on a stand does well) be placed between the head of the patient and the light, the latter being well swung back. The method of examination should be the direct one.

Observation of the preceding precautions will often show things otherwise invisible.

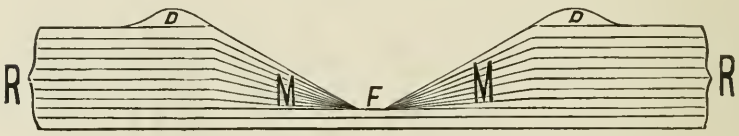
It is true that in *old* persons frequently the spot cannot be found in spite of the greatest efforts. This is, in the majority of instances, due to the clouding of the media incident to old age. The physiological sclerosis of the lens plays quite an important role in obscuring the view, and the senile changes in the retina and choroid also contribute their share. *Among children it is practically impossible to find a subject where careful search does not show up the macula distinctly.* The same can be said of young people, while failure during the prime of life is a rarity, provided always that the media have the normal transparency. I am aware that this statement differs from the general teaching, but I shall presently point out the source of failure in these observations.

Anatomical examination shows that the region of the macula is marked by a small papular elevation in the center of which we find a crater like depression known as the fovea centralis.

At the bottom of the latter we notice that of the 10 layers of the rètina only two remain. These outer two layers are known as the epithelial zone of the retina and are the end-plates, as it were, of the optic nerve. This place being the spot of acute vision where all visual impressions are copied and transmitted to the brain, loss of light must be avoided. For that reason the conducting apparatus of the remaining 8 layers has been reduced to a minimum, while all the necessary fibres are radially crowded aside. As we leave the macula, the other layers regain their original thickness in gradually recovering their normal measurements. In this manner a sort of conical depression is created.

Around its margins an elevation is formed by the peripheral fibres returning from the neighborhood of the meridian in which the macula is situated. Instead of passing over the point of central vision, they diverge in order to join again after winding around its walls. In this manner the macula acquires a projecting rim, giving it the appearance of an exulcerated papule. Ordinarily the sloping walls do not meet at the bottom, but leave a small circular base, known in anatomy as the foveola foveæ.

FIGURE 1.



R. Thickness of retina.
D. Papular elevation due to returning peripheral fibres embracing the macula.
M. Conducting layers (8 upper) gradually thinning down to expose F directly to light.
F. Base of crater, known as faveola foveæ.

We all know that the red glow appearing in the pupil on ophthalmoscopic illumination is not derived from the retina. The latter, in health, is transparent and applied against the middle coat of the eye, the choroid. The latter is made up, roughly speaking of an outer layer of veins of all sizes including the afferent arteries, while the portion turned toward the

retina consists of very fine and uniform capillaries, intimately united by pigmented connective tissue-cells

From this coat, known as the chorio-capillaris, comes the red reflex. The macular region is especially rich in capillaries, hence the deeper hue of that neighborhood. On account of the retinal transparency we should not expect to be able to see its substance during illumination. Still there is one place where this is possible.

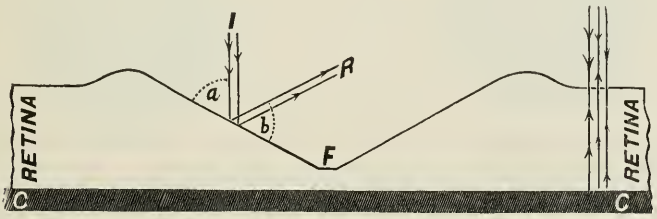
In order to be seen by us an object must send rays of light to our eyes. We notice the red reflex of the chorio-capillaris, because the light thrown into the fundus of the observed eye returns to our own retina. For such a return the light must be almost in the same line with the rays thrown in. Deflected rays would miss the pupil and hence be retained.

Again, while perpendicular lines readily pass through a transparent medium even without refraction, strongly inclined rays are reflected instead of passing through.

Go by a window and you will see the things behind it, when in front of it. As you move on and the angle diminishes the view becomes gradually indistinct, finally disappears and in its place you see the window glass.

Standing before a picture we may not be able to see that it has a protecting plate. Step back to one side and the glass will become visible.

FIGURE 2.



C. Choroid.
F. Foveola foveæ.
I. Incident rays.
R. Reflected rays.
A. Angle of incidence.
B. Angle of reflection.

Fig. 2. shows the optical occurrences which make the slope of the macula visible. It will be noticed that the incident light cannot return, because, the angle of incidence equalling the angle

of reflection, the light is scattered in the fundus. Diffused rays, of which some reach our eyes, illuminate the slanting portion of the retinal tissue and show it in a yellowish-white color

However, the very presence of sloping walls would make them visible, for the greatest quantities of light are received by surfaces at right angles to the impinging rays, while sloping surfaces lose in brightness in direct proportion to the amount of inclination. Now, it is just exactly this difference of illumination which enables us to distinguish different objects and to form the idea of perspective in our mind.

The visibility of transparent substances at greatly inclined angles increases with the resistance offered to light. Translucent objects are, therefore most easily noticed.

Now, the retina is not transparent in the sense of glass, for its structure is not homogeneous Microscopists can easily demonstrate this by showing the various layers of the retina without staining fluids. It is, at best, translucent.

It might be compared to a very delicate skin or, still better, to a fine sheet of soft rubber. Experiment will easily demonstrate our theories.

A surface painted red and covered with wax paper will show red in an imitation eye as long as the rays impinge upon it at right angles. At a sufficient slope the paper cover becomes visible.

There is another *incontestable* proof of my assertions. It is a clinical fact that in detachment of the retina the latter becomes visible at the place of separation. Its sloping surface presents a grayish white reflex, differing from the red of the fundus.

In detachment the vascular supply is not disturbed. Occasionally re-application ensues, which also shows that detached portions are healthy, at least for some time.

Speaking of the appearances of the macula we have to call attention first of all things, to the variability of its images. The most frequent form represents a red dot surrounded by a whitish ring. The latter is created by the sloping walls, while the dot in the center stands for the *foveola foveæ* (first form.) This form (I) is found in 75 to 80 % of children not over 14 and very nearly as often in young people up to the age of majority.

After that it becomes less frequent. I want to say here that I supplemented the material of my private practice by examinations in schools and in the House of the Friendless. Some old people (above 50) I was allowed to examine at the State Insane Asylum No 1, situated near St. Joseph.

The second form represents a white ring, more or less elliptical and without the central red dot. Here the sloping walls of the macula meet at the bottom. (Fig. 1.)

A form directly derived from the preceding is a narrow linear space of whitish color. The walls are here very much compressed laterally, whence the linear appearance (third form).

Sometimes the walls are quite high in one place and low at the opposite point. Here a half-moon or a horse-shoe, or any of the numerous intermediate appearances, result (fourth form).

I.

II.

III.

IV.

NOTE.—No. V is too variable and difficult to represent.

Unusual flatness of the walls enlarges the spot and presents a uniform redness. Very often the red has the appearance of a strawberry. Occasionally minute white dots are seen here and there, but the ordinary whitish reflex is wanting on account of insufficient inclination (fifth form).

All these varieties occur, but very often they are artificial products. This is especially true of Nos. 2 and 5. Careful

correction usually develops them into 1. In fact, the error may be easily produced, for having No. 1, and putting a wrong lens before our eyes, we will at once notice that the outlines become indistinct and the central spot disappears. Not only that, poor correction will in some instances create absolutely unreal images.

I had for a long time wished to meet the case described by Prof. Nettleship as a shifting halo. Sometime last year a young lady consulted me for a small button of episcleritis on the inner side of the corneal border. As usual I subjected her to a dark room examination. I adjusted my opthalmoscope until the optic papilla was as perfect as I could possibly wish it. I next directed her to look at the light in the mirror. How great was my surprise and how delighted was I when I saw that mysterious shifting white "halo." Indeed it did shift! with every movement of the mirror, with the slightest tremor of the eye. The best description I could give would be to liken the restless reflex to a quivering spark of light as drawn from a small static machine. I looked and examined until I was satisfied I had thoroughly observed this form of macula. Presently my prosaic inquisitiveness awoke. I turned my lenses and, alas! the pretty stranger had disappeared. First it changed into an ill-defined white patch, next a fairly well formed horse shoe took its place and finally form I, as described before, was seen in all its beauty and perfection.

It should be remembered, then, that a lens which shows a well defined papilla is not necessarily adjusted for the macula. Occasionally this is the case, often, however, the focus is shorter. In several cases an addition of 2–3 D. is necessary to bring into view the region of central vision. Roughly, 1 D. would shorten the focal distance in the average eye $\frac{1}{3}$ mm. hence such extreme differences would indicate that the visual axis may be as much as 1 mm. shorter than a line passing from the papilla through the center of the lens.

This fact also shows that oculists, who pretend to measure the refraction by means of the ophthalmoscope to within $\frac{1}{2}$ D. in *all* cases, are not very particular observers; for fixing a vessel, or the papilla, they do not necessarily obtain a correct focus on the macula. Of course, $\frac{1}{2}$ D. may in many cases be a sufficient

allowance, but by no means in every instance. In fact, I have often felt surprised that sometimes I could find almost the exact refraction with the ophthalmoscope, while at other times I was mistaken from 1–1½ D. It now occurs to me that the most exact work is to be done with the macula as a "*point de repère.*"

Another peculiar observation is the fact that the macular appearances described under 5 become more frequent as age advances. It occurred to me that in the course of time the macular excavation gradually flattens. I do not know of any anatomical data in favor of this assumption, but I expect to inquire into that matter as soon as I find time. Appearances indicate that the process mentioned actually does take place.

The forms under V are quite rare in childhood, but become frequent in middle-aged people. This alone shows that changes in the macula must occur between those ages.

Flattening of the slope would abolish white reflexes, since, with an inconsiderable inclination, the incident rays strike the retina almost at right angles which would cause the ordinary red reflex. The red of the shallow crater would be in direct connection with the increased hue of the macula in general, tending to enlarge the appearance of that spot, at least seemingly. Observation shows that to be so.

Gradual flattening of the foveal crater also would furnish an easy explanation for the invisibility in old age, even with slight turbidity of the media.

CONCLUSIONS.

1. Except in very old people the macula lutea is easily visible in the *vast* majority of all persons with perfectly transparent media, provided the observer be thoroughly familiar with the direct method and examine under mydriasis only.

2. The typical form of macula presents a red central dot surrounded by a circular band of whitish color. The red center corresponds to the foveola foveæ; the white ring, to the fovea or the walls of the crater.

3. The macula needs special adjustment of the ophthalmoscope, since it is usually nearer to the observer than the papilla optica.

4. Secondary (or atypical) forms should not be considered

real until after careful focusing. The observer will be surprised to find that such forms more often develop into a perfect No. 1 than retain their first appearance.

5. If in a healthy eye the macula presents an indistinct appearance, it, very likely, also shows a false image and should be focused correctly.

6. The foveola (red central spot) may be absent, if the slopes are steep and meet at the bottom.

7. The white band may be incomplete owing to the small size (or absence) of the slopes in one direction. This occurrence is quite rare, the corresponding picture being usually resolved into a No. 1, with correct adjustment.

8. Whenever the macula is recognized only by its deeper red and the radiating vessels, its appearance may vary a great deal; a classification is impossible on account of the great irregularity.

112 South Eighth Street.

REPORT OF A CASE OF FOREIGN BODY IN THE CHOROID AND RETINA WITH RETENTION OF GOOD VISION.

Written for the Ophthalmic Record by

C. D. ROY, M D., Atlanta, Ga.,

From the University Clinic of Prof. Sattler, in Leipzig.

The following case, occurring in the University Clinic at Leipzig, is one of considerable rarity and for various reasons is one of much clinical interest.

Otto——age 6, was brought to the Clinic by his mother on Aug. 2nd, of this year, on account of an injury received the day before. While hammering a piece of steel, a particle was thought to fly off and strike the child in the right eye although no foreign body could be discovered.

Status præsans:—The right eye on inspection is slightly congested. No pain is complained of. On closer inspection a wound $1\frac{1}{2}$ mm. from the limbus cornea and 1 mm. in length

could be seen on the temporal side of the sclera. Slight pericorneal injection. Pupil dilated ad maximum. Fundus and media, on ophthalmoscopic examination, quite clear and apparently normal. A few hazy streaks could be seen in the corpus vitrei. V = $\frac{5}{10}$.

Aug. 3rd, ciliary injection quite prominent. Very little pain. By ophthalmoscopic examination high up in the fundus a red mass of about 3 or 4 mm. in breadth could be distinctly seen. In the center of this was a dark spot and by very close observation was readily diagnosed as a piece of steel. The red mass was a blood clot from hemorrhage into the choroid. Localized hyperæmia of the retina and choroid were also noted. There was slight haziness of the vitreous body. Lens was perfectly normal, the foreign body evidently not having touched the same.

Aug. 6th, V = $\frac{5}{10}$ w + 0.5. No material change.

Aug. 8th, blood clot is disappearing, leaving pigmentation. V = $\frac{5}{10}$ w + 0.50. Patient complains of no pain and there is scarcely any inflammatory reaction in the eye.

Aug. 10th, V = $\frac{5}{10}$ w + 0.50.

Aug. 17th, V = $\frac{5}{10}$ w + 0.50. Vitreous is now quite clear.

Aug 22nd, V = $\frac{6}{6}$ w + 0 50. Pigmentation remains. The foreign body is more or less encapsulated in the retina.

Sept. 24th, V = $\frac{6}{6}$ without glass. There is still pigmentation at the point of injury but otherwise the eye is perfectly normal.

The treatment throughout consisted in atropine instillation. Warm formentations to the eye and general regulation of the systemic condition. In many respects the case is interesting and very unique in character.

The ease with which the foreign body penetrated the tough sclera; its passage by the lens without injury to the same; the small amount of irritation occasioned by its presence, and the perfect vision which finally resulted with the body still in the eye, add much to the interest of the case. Throughout the treatment the patient complained of scarcely any pain As would naturally he expected a small scotoma in the lower field of vision resulted from the injury to the retina. It is now three months since the date of injury, and the vision with the general appearance of the eye is seemingly perfectly normal. The piece of

steel is still distinct though partly encapsulated. In looking over the literature of the subject, I find 16 cases published of foreign body remaining in the eye, generally with retention of useful vision. In my search I am sorry my time did not permit me to make it more exhaustive, etc.

I must acknowledge my indebtedness to an article by Prof. Knapp, in Knapp's Archives, 1883, from which I gathered the literature of the subject up to 1883. In this article, Knapp reports 12 cases as having been published up to that time The first three were by A. v. Græfe (Knapp's Archives Vol. III) where small bits of metal had penetrated the eye to the inner tunics, remaining free and unencapsulated. They produced some hemorrhage, but no oblation of the retina. From the point of the foreign body was a small scotoma but otherwise useful vision was recovered.

The *fourth* was by Jackson (v. Græfe's Arch. 1865, Vol. IX), a small bit of stone which passed through the cornea and lens, remaining free in the fundus near the papilla. Cataracta tramuatica followed which was removed, and with lens correction useful vision resulted. Scotoma. V = $\frac{1}{8}$.

The *fifth* case was by Jacobi (v. Græfe's Arch. Vol. XI). A piece of iron 0.75 mm. wide entered the eye, the sharp end remaining stuck into the retina. Became encapsulated. Lens was intact. Vision of $\frac{20}{20}$ resulted.

The *sixth* case by Hirschberg (1874, Klin. Beobachturgen). A small piece of metal passed through the cornea, iris, lens and vitreous and remained imbedded in the retina, not far from the optic papilla. Did not become encapsulated. A year after the injury the vision was $\frac{3}{200}$ on account of some opacity of the lens.

The *seventh* case was also by Hirschberg (1875, Berlin Wachenschrit). A splinter of iron lodged in the fundus oculi with one end free in the corpus vitrei. There existed a circumscribed scotoma V = Sn. $1\frac{1}{2}$, 7″, eight months later.

The *eighth* case by G Strawbridge (Trans. Am. Opth. Soc. 1878). The head of a small iron pin pierced the sclerotic and imbedded itself in the fundus or little way from the papilla. The vitreous was full of moving opacities. No irritation in either eye, V = $\frac{20}{90}$.

The *ninth* case was by O. Siegel (Jahresbericht für 1876). A small piece of percussion cap entered the eye and remained imbedded near the macula. The irritation in the eye lasted but a few days $V = \frac{5}{18}$. Seeing defect near the point of fixation.

Tenth case by Dr Briere (Annals d'occulist., 1877). A small piece of steel entered the eye and was distinctly discernible in the fundus. Severe irido-cyclitis followed the injury. Under treatment the eye rapidly grew better and finally no signs of changes could be seen, save the encapsulated foreign body. A year latter, $V = \frac{20}{50}$.

The *eleventh* case is by S. Schnell, of Birmingham (Lond. Opth. Hosp. Reports, 1878). A small piece of steel passed through the sclerotic and lodged in the retina near the papilla. Only a small atrophic spot with a small black body in the center remained. Patient read Jager No. 1, and V. was even as good as with the uninjured eye.

The *twelfth* case by Hirschberg (Knapp's Arch., 1880). A small bit of iron pierced the sclerotic and imbedded itself near the papilla in the retina. Small scotoma existed. $V = \frac{15}{200}$.

The *thirteenth* case is by Knapp himself. A small piece of iron passed through the iris, lens and vitreous and imbedded itself in the retina with one end free in the vitreous. Circumscribed scotoma existed, $V = \frac{20}{20}$. Ten weeks later the eye was still in a good condition. Knapp also makes mention of a case occurring in his clinic during his absence. It had not been published.

The *fifteenth* case is by Dr. Hosch (Knapp's Arch. 1889). Was consulted by the patient for defective vision. Several months before a small piece of steel had struck her in the eye, the physician not being able to discover any foreign body and no irritation of the eye having resulted, the accident had been forgotten On examination a small linear scar in the cornea was formed as well as a perforated spot in the iris. By the ophthalmoscopic examination, a yellowish white body with glistening borders could be seen projecting from the retina and with pigmentation of a small area of the fundus surrounding. The rest of the fundus was normal. $V = \frac{12}{200}$.

The *sixteenth* case is by Dr. A. Eleching (Knapp's Arch., 1890).

Patient while working at his business was suddenly struck in the eye by a small piece of iron scale. On ophthalmoscopic examination, a brownish black plaque in the neighborhood of the macula could be readily seen. In the center of this yellowish brown mass, could be seen the black foreign body. V = $\frac{6}{24}$, atropinized, w. + 1.50°. The body became encapsulated, no further trouble with the eye was experienced, save a circumscribed scotoma; and with a + 0.75 patient had a vision of $\frac{6}{12}$. These are all the published cases which, in the limited time at my disposal, I have been able to find. I wot not but that there are other cases especially those unpublished and trust that this article may prove an incentive for the publication of the same.

Leipzig, Germany.

UNUSUAL EFFECT OF JEQUIRITY IN CHRONIC TRACHOMA.

Written for the Ophthalmic Record by

R. C. HODGES, M.D.,

Galveston, Texas.

Since my first trial of jequirity, I have had a most unbounded respect for the remedy and have avoided its use as far as possible. During the past winter, in my clinics at the John Sealy Hospital, a great variety of cases of Trachoma presented themselves for treatment. For purposes of comparison and for instruction of students in attendance, I selected three cases for treatment by jequirity. The results were so satisfactory, and the effects so unusual and the method so different from that ordinarily employed, that I report the cases.

All authorities advise that a perfectly fresh preparation of jequirity be used, and that from one to three instillations of the infusion be made, rubbing it well into the conjunctiva. Not having any fresh infusion at hand, I tried first a solution, probably 3 or 4 years old, prepared by Parke, Davis & Co., but still in original package, wrapped and sealed.

Case No. 1. Mr.——, Laborer, age 50. Physical condition: very anæmic, chronic trachoma and pannus both eyes, stenosis of canaliculi, on both cornea several small excavated ulcerations. V = counts fingers with difficulty at 4 feet. Condition had existed for four or five years Patient had been under treatment at intervals during most of this period. On admission to hospital, we began the use of iodide of silver, but being such a typical case for jequirity, we decided to use it.

Both canaliculi were freely opened, washed out with 1 to 20,000 biniodide solution for several days and patient given general tonic and nutritive treatment. Beginning with left eye, I applied the jequirity infusion, 1 to 3 of water, freely rubbing it in. At the end of 24 hours, no reaction presenting, it was again employed. The next day the same application, with full strength of the infusion. Twenty-four hours later, or after third application, there was slight irritation of conjunctiva, some mucous discharge, but no swelling of lids, but both eyes looked better. From this time on the infusion was dropped in the eyes daily for seven weeks, every day bringing marked improvement in condition, until the conjunctiva became smooth and normal, the cornea clear and vision greatly improved. After the first week I used the jequirity in the right eye also with exactly the same results, and dismissed patient at the end of six weeks.

Case No. 2. Age . Right trachoma, pannus very thick, slight entropion with distichiasis. The jequirity was used in this case precisely as in first one, and during its use the distichiasis treated by depilation and canthoplasty. The results were highly satisfactory. The third case was one of trachoma, with however no corneal complication. The jequirity was used for three weeks with considerable improvement, but was finally abandoned for the iodide of silver, under which treatment he rapidly recovered.

My reasons for citing these cases in detail are first, to call attention to the fact that jequirity was used in one case seven weeks daily; one, six weeks; third, three weeks and at no time was there any inflammatory action more severe than in a simple acute catarrhal conjunctivitis. Second, the result in two cases was all that could be desired and all that is ever accomplished

by the use of a fresh solution and the most violent inflammation. My conclusion from these cases, which I hope to re-inforce by further investigation, is that the curative effect of jequirity is due to some principle in the jequirity not yet recognized and isolated, and not to the destructive action of the violent inflammation it excites. The time was when I hoped to see a specific for this disease discovered. I continue to use in my own practice, with gratifying results, iodide of silver, but I do not forget that cases have their individual peculiarities and that no one rule of treatment can apply to all cases.

In my hospital work this year, where I have the best of assistance and facilities, trained nurses, etc., I shall continue my investigation and report results later.

A CASE OF SO-CALLED HEMORRHAGIC GLAUCOMA.

Written for the Ophthalmic Record by
F. C. HOTZ, M.D., Chicago, Ill.

In January 1889, a negro, 70 years old was admitted to the Illinois Charitable Eye and Ear Infirmary, with occlusion of the pupil of L E. (result of acute iritis four months previously). Shallow anterior chamber, T. + 2; and violent ciliary neuralgia. January 29th, iridectomy upwards under cocaine. Though the eye was very sensitive (the repeated application of cocaine evidently having no effect), I succeeded in excising a large piece of the iris. The T. was decidedly lowered after the operation, but the wound was very slow in healing, and it had scarcely closed when the T. rose again and the paroxisms of violent pain returned. A second iridectomy (downward) in chloroform narcosis (February 20th), was followed by a violent iridochoroiditis and the sufferings of the poor patient were so intense that I was compelled to enucleate the eye on March 12th; the enucleated eye opened by an equatorial section exhibited a cataractous lens; a cloudy yellowish vitreous; a very deep glaucomatous excavation, and a fundus thickly speckled from

the papilla to the ora serrata with numerous blood spots, a part of them being dark and old, another part of them bright red and fresh.

On the 18th of March, the patient left the Infirmary, but at the end of April he was brought back almost blind. A few days previously the sight of the R. E. (which we had frequently examined and found normal) had suddenly failed. He had perception of light only; the media were clear too, but the neighborhood of the papilla and the region of the macula were dotted with numerous small hemorrhages. I watched this eye very closely and made frequent tests of its tension. Some of the blood spots were absorbed, new ones appeared and the retina became quite cloudy (œdema) but all through the month of May, T. remained normal, and the patient had no pain. And this condition continued till the 12th of June, when without any warning, a violent storm of ciliary neuralgia set in and the eyeball showed a stony hardness. Eserine had no effect, and the iridectomy performed in narcosis (June 14th) was followed by a severe inflammation. I was afraid this eye too would have to be enucleated, but fortunately the storm subsided, the neuralgia ceased; and the tension remained normal as long as the patient stayed in the hospital (July 20th), but the sight never returned.

It had been stated by Von Græfe, Pagenstecher and other observers that there was always an interval of from several weeks to several months between the appearance of the retinal hemorrhages and the glaucomatous attack, and that there really existed no causative relation between the two conditions, but that it was more likely that both, hemorrhages and glaucoma, had a common origin in a morbid state of the blood-vessels (arterio-sclerosis). But as occasionally the opinion is still upheld that the glaucoma was directly due to the hemorrhages, I felt warranted in reporting this observation. If the hemorrhages were the local cause of the glaucoma attack, we should certainly expect to find the intra-ocular tension disturbed directly or within a few days after the retinal hemorrhages occurred. But when my patient returned to the Infirmary with the hemorrhages in the right eye, I closely watched this eye just for this one purpose, to see how early I could detect any change in the

intra-ocular tension. But for six weeks frequent and careful tests failed to detect any disturbance of the tension, when, without any premonitory signs, the acute attack burst out with all its fury. This plainly shows that the glaucoma is not induced by the hemorrhages, nor these by the glaucoma, and that the name "hemorrhagic glaucoma" is not a very good designation for these cases.

EUROPHEN.

Among the New Surgical Dressings Europhen seems to have quietly taken an elevated position as a positive and complete substitute for iodoform. It seems probable from recent investigations that we must rely upon some form or combination of iodine in order to secure a perfect, local antisepsis. The reports tend to coincide as to two or three very considerable advantages possessed by Europhen. The chief of these lies in the fact that the iodine component of Europhen is given off slowly, thus presenting fresh, or nascent, iodine to the tissues, and maintaining the healing process. A further advantage in this slow development of iodine is, that it prevents the possibility of irritant or toxic action. This is why large denuded surfaces, like burns or scalds, may be fully covered with it, and not give rise to any untoward effect. Europhen, in fact, appears to be especially adapted to extensive lesions, since its covering power is five times greater than that of iodoform, while its odor, though faint, is sufficiently well characterized to neutralize the peculiarly disagreeable fragrance attached to all surgical dressings. We note that recent clinical articles in approval of Europhen in the dermatoses, traumatisms and ulcerations, as also in specific lesions, have been written by Drs. Allen, Chappell, Shoemaker, Giles, Fernandez, Gilbert, Eichler and many others, who have extended the uses of Europhen to ophthalomology, gynecology and rhinology as well as the needs of minor and general surgery.

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REPRODUCTION OF NO. 1, VOL. I.

We have had so many urgent calls for Vol. 1 of the *Record complete*, from oculists in this and foreign countries, we have decided to reproduce No. 1 of the volume, which has been out of print a long while. To do this without loss we must have at least 100 more requests than have been received up to date. Any one desiring the complete volume at the regular subscription rate ($2.00) will please notify me so that I may know how many copies to reproduce.

BOOK NOTICE.

Fuchs' "Text-Book of Ophthalmology," as translated by A. Duane, M.D., of New York, and published by D. Appleton & Co., will make a most valuable addition to the library of any one interested in the subjects treated. The style of the author is easy and pleasing; and so clear are his expressions that no one can doubt his meaning. In the main he is correct in his teaching. On the subject of pterygium, however, there are not many who, having had good opportunities for observing, will agree with him that this growth has a pinguecula for its starting point;

and that it "occurs only in elderly people." In this country, and still more markedly so further south, it is very commonly found in young and middle aged people. In fact when seen in an old person, the history of the case will show that it has existed many years.

Fuchs' chapter on "Diseases of the Conjunctiva," covering 92 pages, is unsurpassed in any book. More than half the book is devoted to those diseases whose existence and nature can be determined without the aid of the ophthalmoscope, and is, therefore, a book well suited to the general practitioner of medicine.

In this short notice it is not possible nor, in this case, is it necessary to review every chapter; but, before closing, it may be said that the chapter devoted to "disturbances of motility of the eyes," while containing much that is good and true, is not a complete exposition of what is known at the present time. The fact is that the most useful knowledge pertaining to the ocular muscles has not yet been perfectly incorporated in any text-book. In the light of recent investigation a *new* chapter will have to be written even on the so common condition, strabismus.

ENGRAVING AND PRINTING.

Nashville can boast of the largest Engraving and Printing establishment in the South—indeed there are few houses in the East or West which can rival it in size or volume of business. The Brandon Printing Co., occupy a six story brick house, on the corner of Union St., extending from Market to Front Sts. They have a thoroughly equipped, modern establishment and can do all classes of Engraving, Printing and Blank Book work. They also have a large Stationery department, and in addition are the general Southern agents for the sale of the justly celebrated Smith-Premier Typewriters. We cheerfully recommend this house to our readers.

Department of Otology, Laryngology and Rhinology.

Geo. H. Price, M. D., Editor, 621½ Church Street,
NASHVILLE, TENN.

THE USES AND ABUSES OF COCAINE

WITH REFERENCE TO

MUCOUS MEMBRANES ESPECIALLY.*

By ARTHUR G. HOBBS, M.D.,

Atlanta, Ga.

Ex-President of The American Rhinological Association, Member of the American Medical Association, of the Georgia State Medical Association, the Atlanta Society of Medicine, Etc.

Since I received my first 20 grains of the hydrochlorate of cocaine (a part of the first two drachm package that arrived in New York), I have used many ounces; perhaps, altogether, by myself and assistants, as many pounds as my original package contained grains.

It will not be amiss for me to say in the beginning that I now have very different opinions of its uses, from those I entertained during the first years of its advent. However, one of my original opinions of its applicability has only become more and more confirmed with my increased use of it; and that is that its utility is principally confined to its local application to mucous membranes.

* Read at the 10th Annual Meeting of the American Rhinological Association, September 20th, 1892.

The softer the mucous tissue to which it is applied, the sooner is its effect reached and the less the quantity necessary; and, as a consequence, the quicker and more decided is the toxic effect when its application is persisted in to this extent.

The general symptoms, however, are, everything else being equal, much oftener present in proportion to the area of membrane surface involved, than in proportion to the strength of the solution applied. Hence, sprays of a weak solution are liable to produce toxic symptoms, when much stronger solutions can be applied with a saturated cotton probe or wad, to a limited area, almost with impunity.

The constitutional effects of cocaine are manifested by a feeling of faintness—it may be even to the loss of consciousness—a trembling of the limbs, a pallor of the face, etc., any or all of which may appear in one minute or in fifteen minutes after the application to a large surface. Again, these symptoms may be produced by a small quantity of a one per cent solution in one individual and not in another; even if in the latter both the strength and quantity be ten times multiplied I have never yet reached a conclusion as to the average amount of cocaine that is necessary to produce the constitutional symptoms; neither do I ever know, the first time I use it, how to estimate the individual's susceptibilities.

Every individual seems to be a law unto himself as to the quantity necessary in his own case to accomplish complete local anæsthesia; and even in the same person the amount will vary at different times, with no apparent cause. Under similar circumstances I find it impossible to reach a complete local anæsthesia, in some, short of the toxic symptoms; when in others, one-tenth of the amount and one-tenth of the time will render the application of a galvano-cautery absolutely painless

To obviate the unpleasantness and delay caused by the constitutional symptoms, it is my custom to administer a stimulant of brandy or whisky at their first indications, and make the operation quickly and, always under such circumstances, painlessly. When it is found by trial that one bears the drug badly, it would be well always to give a stimulant before the second application is made.

I am sure that the last thousand galvano-cautery operations I have made would represent a much greater per cent that were absolutely painless, than the nearly three thousand cauteries that preceded. Perhaps this has been due to my greater familiarity with the technique of cocaine applications in the more recent cases.

In some, its effects in the superior pharynx are peculiarly distressing, more especially at the first application, but less and less so afterwards. However, it is well to remember this and avoid it, when making local applications above, by not allowing the solution to gravitate from the cotton plug.

The time necessary for cocainizing a mucous membrane is perhaps as indefinite as the strength of the solution; both due to that unknown quantity—the individual. Approximately, however, four to ten minutes and a four to a ten per cent solution for a small surface may be regarded as an average. If the intention is to produce the effect over a small surface only, as in galvano-cautery operations, a concentrated solution—ten to twenty per cent—should be used, and the result expected in four to eight minutes.

If, however, a general turgescence of any membrane should suggest the use of cocaine, then a spray of a very weak solution—a one or a two per cent—should be expected to accomplish the desired result in one or two minutes. In either case, the general effects may appear without any warning and mar the anticipated good results or, at least, render an otherwise easy operation, tedious and unpleasant.

It has been my custom, from the beginning, to make my solutions at the moment I use them and to vary their strength according to the case, and as I use no weights or measures, I never know, only approximately, the strength. The range is so great that I hesitate in stating it, as I have not space to give my reasons for sometimes using a one grain to the minim solution, and again, only a one grain to five hundred minims. As a general rule, however, the strength should be in inverse proportion to the surface to which it is applied. Since my many disappointments with ready-made solutions of cocaine, during the first few months of its advent, I have never risked any solution that had not been recently dissolved.

In case it should be necessary to dissolve a large amount, it would be well to add boric acid for its preservation, in a proportion of about one grain of the latter to ten grains of the former.

For safety, it is best to supply the drug instead of giving the patient a prescription to have filled and bring with him for an appointed operation. The operation will thus be less magnified in the patient's mind and he will be less liable to familiarize himself with the proportions and uses of the drug, should the temptation to use it himself arise afterwards. For these reasons, I do not, in any instance, give a patient a prescription containing cocaine as its leading ingredient.

As an ingredient in sprays, I find it abused more, perhaps, in hay fever prescriptions, than anywhere else. This is true also where it is prescribed in the form of powders for this disease.

The turgescent condition of all the mucous membranes of the upper respiratory tract, especially in the nasal turbinates, that is always present in hay fever patients, is so quickly palliated and rendered bearable, that the temptation is great to prescribe cocaine in some form for the patient's own use; but it is a dangerous experiment and one to be ventured upon only in exceptional cases.

During the past few years I have seen many journal articles that claimed for it a decided aphrodisiac affect, while my observation have been universally to the contrary. It will not be departing too far from the subject if I mention the effects of cocaine (through the mucous membranes) upon two cases of priapism, notwithstanding the fact that the results in these cases were reached through the general systemic impressions of the drug. The two young men, who were the victims of this rather unusual disorder, came under my observation by accident, and at intervals of about three years, each came to my office in a carriage for a coincident nasal and pharyngeal inflammation. Cocaine dissolved in vaseline, together with a small quantity of camphor-mentholine, was sprayed into the nasal and pharyngeal cavities to the great relief of all the unpleasant symptoms in these regions.

But this was not all. In the first case, to my surprise and to

the patient's great joy, the other and more painful malady disappeared within ten minutes. In the second case the symptoms were almost exactly like the first, and the patient's delight was greater than my surprise, as I was this time anticipating a similar result from the same treatment. The relief of the priapism, in both cases, remained permanent.

In both instances, the usual treatment for such cases had been resorted to apparently without any result for 24 and 36 hours respectively, only to be completely relieved by a cocaine spray used upon a distant mucous membrane for a coincident malady. It would seem that in these cases cocaine acted as an anaphrodisiac, and it should not be surprising when we remember that its primary effect is to reduce a turgescence of the turbinates, and that these tissues are analogous in many respects to the erectile tissues that are involved in priapism.

I desire here to emphasize most decidedly one contra indication in the use of cocaine as a collyrium, and that is that *it should never be used when an abrasion of the cornea exists;* nothing in the form of a collyrium is more deceptive, as it is also most greatful to a denuded corneal surface.

The cornea is covered with the epithelial layer of the conjunctival mucous membrane only; here no middle layer proper exists whence it can derive its nutrition, hence it quickly loses its vitality when subjected to this local anæsthetic. So also the outer layer of the cornea, receiving its nutrition by imbibition only, seems to be even more susceptible to the destructive effects of cocaine.

I have seen a number of cases, during the last few years, (especially since this drug has been introduced into general use) in which the cornea has been greatly damaged by its constant and frequent introduction, for no other purpose than the temporary relief of pain; but unfortunately the relief thus produced proves to be a delusion, and the destruction produced upon the cornea is only masked for the time by the anæsthetic effects.

I have especially seen these bad results in the cases of physicians who had themselves persisted in its use for the comforting effects to their own eyes, both during the presence of foreign bodies on the cornea and after their removal.

Cocaine is contra-indicated also in any corneal inflammation and should not be prescribed beyond the acute stage of any form of conjunctivitis.

I have had but little experience in its use beyond its local application to mucous membrane surfaces, because I have never believed that its range of utility extended any further, except, perhaps, in a very few instances; hence I know very little of its general usefulness hypordermically, as it has usually seemed to me to be quite as painful to introduce it in this manner as the pain of a minor operation would be, especially when we consider the limited quantity that can be borne when it is introduced so directly into the circulation. I have sometimes, however, injected the solution into the tonsilar mass to hasten anæsthesia, but the toxic effects follow so quickly after its introduction into the circulation in this manner, that I always hesitate to resort to this means in an untried subject. Yet, in some operations on the eye, as in tenotomies, iridectomies, cataract operations, etc., I frequently use the syringe for introducing a weak solution—one to two per cent—subconjunctivally, in subjects that do not succumb to a four to six per cent solution applied superficially for fifteen to twenty minutes at short intervals.

In preparing for a tonsil amputation, I use a cotton probe saturated in a five to a fifteen per cent solution, and apply it to the whole surface of the mass at once; then I send the patient to a waiting room and perhaps in the meantime—about eight or ten minutes—see another patient; than make a second thorough application and wait three to five minutes before I use my knife and hook tonsilotome.

Occasionally, in an extremely sensitive patient who has not by this time exhibited any of the general effects, a five per cent solution may be introduced into the tonsilar mass with a long hypordermic needle before proceeding to amputate.

In nearly five thousand tonsil amputations (four-fifths of which were done under cocaine) I have never had a dangerous hemorrhage and not more than a dozen cases that even proved to be troublesome from this cause.

Undoubtedly, cocaine exerts a decided hæmostatic effect upon hypertrophic tissue, especially when it has thoroughly saturated

the mass before an incision is made. Yet, after the solution of continuity, its blood-staying qualities are not equal to many other hæmostatics, and it cannot be relied upon for this purpose.

During the first years of its use, this drug was vaunted by many writers in the medical journals as a great panacea—as *the sovereign remedy* for ear-ache, but, naturally, disappointment followed quickly in the practice of these theorists, who seemed not to remember that the outer layer of the membrana tympani was not a mucous layer, else they failed to remember the fact that an aqueous solution of cocaine could be only sparingly absorbed through a cutaneous epithelium.

After the rupture or incision of the drum membrane in an acute catarrhal inflammation of the middle ear, when it becomes possible for the solution to reach the membrane involved, the call for relief from pain has already ceased. When it is practical to introduce a few drops of a strong solution into the middle ear cavity through the eustachian tube, the pain is usually relieved at once; but as it is not always possible to do this on account of the swollen mouth of the tube and as another question arises here beyond the scope of this paper, as to the advisability of the trial in any case, cocaine cannot be regarded as so great a panacea in ear-ache as it was first claimed to be by many who wrote only upon faulty theoretical grounds.

I have occasionally heard of cocaine habitues, all of whom were physicians, but I have had no personal experience with these unfortunates. Such cases will be found to be linked with the whisky habit in the great majority of instances.

I think, however, that we should always remember the danger of such a consequence when making a prescription containing cocaine and be guarded when even its suggestion arises.

Like all drugs that are potent for good, cocaine is also potent for evil. Like fire, it is a good servant but a bad master.

ABSTRACT OF A PAPER ON

AN IMPROVED GALVANO-CAUTERY SNARE; ITS USE IN THE NOSE AND THROAT.*

By HANAU W. LOEB, A.M., M.D.,

St. Louis, Mo.

Professor of Diseases of the Nose and Throat, Marion-Sims College of Medicine; Laryngologist to the Missouri Pacific Hospital and to the Missouri, Kansas and Texas Hospital; Surgeon to the Nose and Throat Department of the Grand Avenue Free Dispensary.

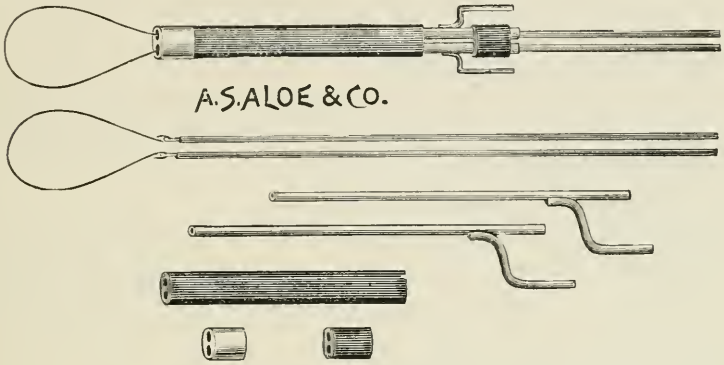
After commenting upon the great necessity of improvement in the galvano-cautery snares now in vogue, and, after stating the shortcomings of such instruments, the writer presented his own snare as one which could be kept clean under all circumstances.

In this instrument the insulating material is rubber which can easily be removed from the canulæ, while in the older instruments a covering of thread or silk which, once soiled, is always unclean, constitutes the insulation. The canulæ themselves are easily removable and hence are just as readily cleansed.

To obviate the great length of platinum wire which all other snares necessitate. the writer has added a little device which consists in passing two stout copper wires through the canulæ. Each wire contains a little eyelet in its flattened end, through which the platinum wire is inserted and the ends bent so that, when the wire is pulled into the canulæ, they cannot escape. There is less inconvenience in threading the little eyelet than in passing the wire through the old canulæ. An ivory tip, similar to those already in vogue, completes the instrument.

* Read in the Section of Laryngology and Otology of the American Medical Association, June, 1892.

The snare is applicable to the slide handle made by the McIntosh Battery and Optical Co., from whom as well as from A S. Aloe & Co., St. Louis, Mo., the snare may be procured.



The following are the advantages of the instrument:

1. Cleanliness. Every portion is removable, the rubber insulator, the two canulæ, the two copper wires, the platinum wire and the ivory tip; it is therefore easy to treat them as is ordinarily done with all surgical instruments.

2. Less expense. The platinum wire is not so frequently broken and, when it is, it may be replaced at a trifling cost.

3. The instrument is firmer and therefore more easy of manipulation.

4. The current required is undoubtedly less.

5. There is no danger of short-circuiting the current.

As to the range of application of his snare, Dr. Loeb stated that in the removal of tonsils it was specially of service. Tonsils in all conditions of hypertrophy, except when thoroughly impacted between the pillars of the palate (even then a small portion may be removed), are excised with more precision and with less danger or inconvenience than by any other method, while the pain and time required are not increased. The tonsil is drawn out from between the palatal pillars by means of forceps and the snare is engaged so that as much of the tonsil is removed as is desired or desirable. Ear-pain and inflammatory reactions are no greater than after the tonsillotome operation.

To remove the uvula the snare is pleasing. The uvula is allowed to drop into the loop, the wire drawn tight, the current turned on and the uvula removed, no forceps being necessary. Less pain follows this operation than that with the scissors or uvulotome, apparently because the forceps or forks of the uvulotome draw down the mucous membrane so that more of the mucous membrane is cut away than of the muscular tissue, whereby a considerable portion of the latter remains exposed, making an exquisitely painful stump.

In the nose the snare is indicated wherever the old forms could be used, for the removal of polypi, portions of mucous membrane and of the turbinated bones.

The writer also stated that he had his cautery points covered with rubber instead of with thread, by which is overcome the objectionable lack of cleanliness.

The article was concluded by the comment "quod erat demonstrandum," the writer's observation upon the following communication received from the McIntosh Battery and Optical Co.

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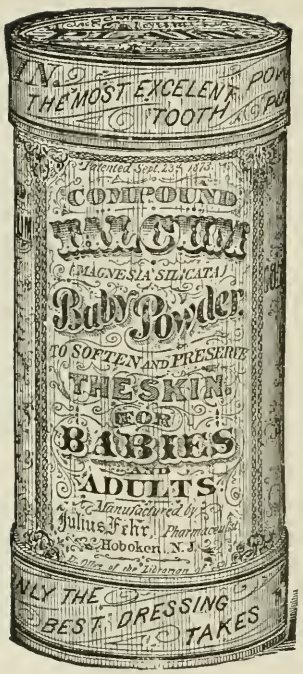

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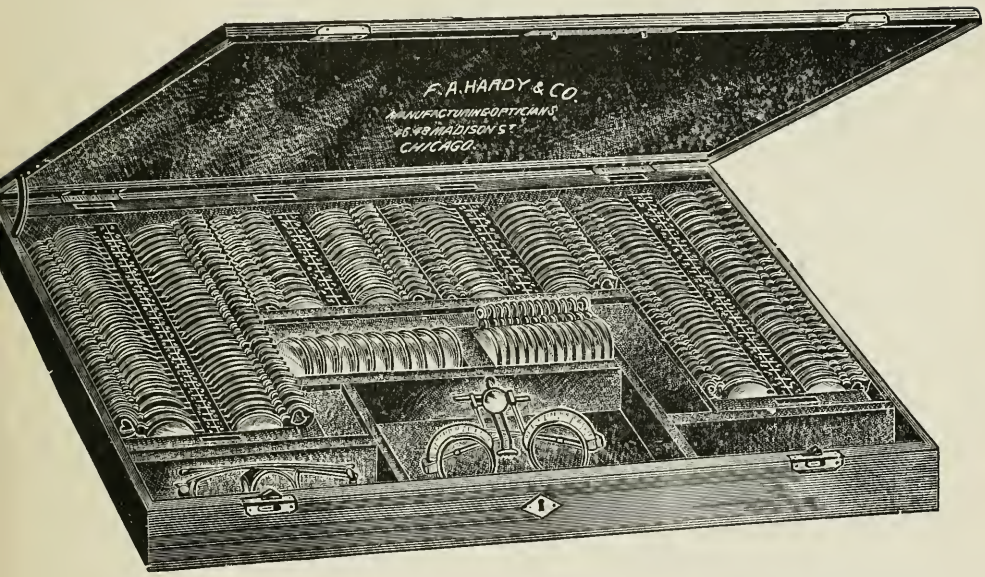

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